The listing of the claims provided below is intended to replace all prior versions and listings of the claims in the application.

LISTING OF THE CLAIMS

1. (Previously Presented) An aeroelastic analysis system for analyzing flutter relating to a completed repair of a structure, the system comprising:

an input module configured to receive one or more input parameters associated with aeroelastic flutter characteristics of a structure, the one or more input parameters relating to a completed repair of the structure; and

a neural network module coupled to the input module, and configured to generate a transformation of the one or more input parameters to produce at least one aeroelastic flutter analysis result, the transformation based in part on a trained neural network, wherein the at least one aeroelastic flutter analysis result comprises at least one of a flutter frequency and a flutter speed for determining whether the aeroelastic flutter characteristics of the structure with the completed repair are acceptable.

2. (Previously Presented) The system of claim 1, further comprising an output module coupled to the neural network module, and configured to output the at least one aeroelastic flutter analysis result.

3. (Original) The system of claim 1, wherein the input module comprises at least one input/output (I/O) device selected from the group comprising a keyboard, a keypad, a computer mouse, a trackball, a button, a switch, a slides, a knobs, and a dial.

4. (Original) The system of claim 1, wherein the input module comprises at least one input/output (I/O) device selected from the group comprising an electronic port, an electrical

connector, a receiver, a wireless receiver, an optical reader, an optical detector, a magnetic reader, and a magnetic detector.

5. (Original) The system of claim 1, wherein the one or more input parameters comprise:

a weight; and

a location of the weight on the structure.

6. (Original) The system of claim 1, wherein the neural network module comprises:

a weight vector module configured to multiply the one or more input parameters by a weighting vector to generate one or more weighted parameters;

a bias module configured to provide a scalar bias value;

a summer coupled to the weight vector module and the bias module and configured to output a sum of the one or more weighted parameters and the bias value; and

a transfer function module coupled to the summer and configured to apply a transfer function to the sum.

7. (Original) The system of claim 6, wherein the transfer function comprises a non-linear transfer function.

8. (Original) The system of claim 6 wherein the transfer function comprises a tangent sigmoid function.

9. (Original) The system of claim 6, wherein the transfer function comprises at least one function selected from the group comprising a sigmoid, a hyperbolic tangent sigmoid, a logarithmic sigmoid, a linear function, a saturated linear function, and a radial basis function.

10. (Previously Presented) The system of claim 1, wherein the at least one aeroelastic flutter analysis result comprises the flutter frequency at a damping value.

11. (Previously Presented) The system of claim 1, wherein the at least one aeroelastic flutter analysis result comprises the flutter speed at a damping value.

12. (Previously Presented) The system of claim 1, wherein the at least one aeroelastic flutter analyses result comprises the flutter frequency and the corresponding flutter speed at a damping value.

13. (Previously Presented) The system of claim 1, wherein the at least one aeroelastic flutter analysis result comprises a contour plot of store loads.

14. (Canceled).

15. (Canceled).

16. (Canceled).

17. (Currently Amended) A computer-implemented method of performing aeroelastic flutter analysis to determine the aerolastic flutter characteristics from one or more completed repairs performed on a structure, the computer-implemented method comprising:

a processor determining input parameters relating to one or more completed repairs performed on a structure;

the processor determining a training set of characteristic I/O pairs;

the processor generating a neural network;

the processor training the neural network using the training set to generate a trained neural network;

the processor determining aeroelastic flutter characteristics of the structure based in part on the trained neural network in order to determine at least one of a flutter frequency and a flutter speed of the structure with the one or more completed repairs; and

the processor determining whether the aeroelastic flutter characteristics of the structure with the one or more completed repairs are acceptable.

18. (Previously Presented) The computer-implemented method of claim 17, further comprising the processor determining an accuracy of the aeroelastic flutter characteristics determined using the trained neural network.

19. (Previously Presented) The computer-implemented method of claim 17, further comprising:

the processor determining a weight vector in the trained neural network; and

the processor determining a bias value in the trained neural network.

20. (Previously Presented) The computer-implemented method of claim 19, wherein the processor determining the aeroelastic flutter characteristics comprises:

the processor multiplying received input parameters by the weight vector to generate weighted parameters;

the processor summing the weighted parameters and the bias value to generate a summed input; and

the processor applying the summed input to a transfer function associated with a neuron in the trained neural network.

21. (Currently Amended) A computer-implemented method of performing aeroelastic flutter analysis, the computer-implemented method comprising:

a processor receiving at least one input parameter related to a completed repair of an aircraft structure;

the processor applying a predetermined neural network transfer function to the at least one input parameter to generate an aeroelastic flutter analysis result comprising at least one of a

flutter frequency and a flutter speed related to the completed repair of the aircraft structure, wherein the aeroelastic flutter analysis result is for determining whether the aircraft structure with the completed repair is acceptable for flight; and

the processor outputting the result.

22. (Previously Presented) The computer-implemented method of claim 21, wherein the processor receiving at least one input parameter comprises:

the processor receiving a weight; and

the processor receiving location of the weight on the aircraft structure.

23. (Previously Presented) The computer-implemented method of claim 21, wherein the processor applying the predetermined neural network transfer function comprises:

the processor multiplying the at least one input parameter with a weight vector to produce at least one weighted input parameter;

the processor summing together the at least one weighted input parameter and a bias value to generate a summed value; and

the processor applying a neuron transfer function to the summed value.

24. (Previously Presented) The computer-implemented method of claim 21, wherein the aeroelastic flutter analysis result comprises the flutter speed at a damping value.

25. (Previously Presented) The computer-implemented method of claim 21, wherein the aeroelastic flutter analysis result comprises the flutter frequency at a damping value.

26. (Previously Presented) The computer-implemented method of claim 21, wherein the aeroelastic flutter analysis result comprises the flutter speed and the associated flutter frequency at a damping value.

27. (Previously Presented) The computer-implemented method of claim 21, wherein the aeroelastic flutter analysis result comprises a contour plot of store loadings.

28. (Previously Presented) One or more processor readable instructions stored in one or more storage devices, the one or more processor readable instructions, when executed by a processor instructing the processor to perform the method comprising:

receiving at least one input parameter related to a completed repair of an aircraft structure;

applying a predetermined neural network transfer function to the at least one input parameter to generate an aeroelastic flutter analysis result comprising at least one of a flutter frequency and a flutter speed related to the completed repair of the aircraft structure, wherein the aeroelastic flutter analysis result is for determining whether the aircraft structure with the completed repair is acceptable for flight; and

outputting the result.

29. (Previously Presented) One or more processor readable instructions stored in one or more storage devices, the one or more processor readable instructions, when executed be a processor instructing the processor to perform the method comprising:

receiving a mass input related to a completed repair;

receiving a location of the mass on an aircraft structure;

multiplying the mass input and location with a weight vector to produce weighted input parameters;

summing together weighted input parameters and a bias value to generate a summed value;

applying a neuron transfer function to the summed value to generate an aeroelastic flutter analysis result comprising at least one of a flutter frequency and a flutter speed, wherein the aeroelastic flutter analysis result is for determining whether the aircraft structure with the completed repair is acceptable for flight; and

outputting the aeroelastic flutter analysis result.

30. (Previously Presented) An aeroelastic flutter analysis system, the system comprising:

means for receiving input parameters relating to a completed repair of an aircraft structure;

means for applying a neural network transfer function to the input parameters to generate an aeroelastic flutter analysis result, comprising at least one of a flutter frequency and a flutter speed, wherein the aeroelastic flutter analysis result is for determining whether the aircraft structure with the completed repair is acceptable for flight; and

means for outputting the result.

31. (Previously Presented) The system of claim 1, wherein the one or more input parameters relating to a completed repair of the structure relate to a repair performed on an aircraft.

32. (Previously Presented) The system of claim 31, wherein the at least one aeroelastic flutter analysis result is generated after the completed repair is completed and before the aircraft is used for flight.

33. (Previously Presented) The system of claim 1, wherein the structure is at least one of a stabilator, a wing, an elevator, a canard, an aileron, a flap, a spoiler, a stabilizer, a tail section, and a rudder of an aircraft.

34. (Previously Presented) The system of claim 1, wherein the neural network is a feed forward neural network.

35. (Previously Presented) The system of claim 5, wherein at least one of the weight and the location of the weight on the structure exceed a predetermined category of approved repair parameters.

36. (Previously Presented) The computer-implemented method of claim 17, wherein the structure is an aircraft.

37. (Previously Presented) The computer-implemented method of claim 36, wherein the step of the processor determining aeroelastic flutter characteristics of the structure based in part on the trained neural network is performed after the completed repair is completed and before the aircraft is used for flight.

38. (Previously Presented) The computer-implemented method of claim 17, wherein the structure is at least one of a stabilator, a wing, an elevator, a canard, an aileron, a flap, a spoiler, a stabilizer, a tail section, and a rudder of an aircraft.

39. (Previously Presented) The computer-implemented method of claim 17, wherein the neural network is a feed forward neural network.

40. (Previously Presented) The computer-implemented method of claim 17, wherein the step of the processor determining input parameters further comprises:

the processor determining a weight; and

the processor determining a location of the weight relating to the one or more completed repairs performed on the structure.

41. (Previously Presented) The computer-implemented method of claim 40, wherein the weight and the location of the weight relating to the one or more completed repairs performed on the structure exceed a predetermined category of approved repair parameters.

42. (Previously Presented) The computer-implemented method of claim 21, wherein the step of the processor applying the predetermined neural network transfer function to the at least one input parameter to generate the aeroelastic flutter analysis result is performed after the completed repair is completed and before the aircraft structure is used in flight.

43. (Previously Presented) The processor readable instructions of claim 28, wherein the step of applying the predetermined neural network transfer function to the at least one input parameter to generate the aeroelastic flutter analysis result is performed after the completed repair is completed and before the aircraft structure is used in flight.

44. (Previously Presented) The processor readable instructions of claim 28, wherein the aircraft structure is at least one of a stabilator, a wing, an elevator, a canard, an aileron, a flap, a spoiler, a stabilizer, a tail section, and a rudder of an aircraft.

45. (Previously Presented) The processor readable instructions of claim 28, wherein the step of receiving the at least one input parameter comprises:

receiving a weight; and

receiving a location of the weight relating to the completed repair of the aircraft structure.

46. (Previously Presented) The processor readable instructions of claim 45, wherein the weight and the location of the weight relating to the one or more completed repairs performed on the structure exceed a predetermined category of approved repair parameters.

47. (Previously Presented) The processor readable instructions of claim 29, wherein the step of applying the neuron transfer function to the summed value to generate the aeroelastic

flutter analysis result is performed after the completed repair is completed and before the aircraft structure is used in flight.

48. (Previously Presented) The system of claim 30, wherein the neural network transfer function is applied to the input parameters to generate the aeroelastic flutter analysis result after the completed repair is completed and before the aircraft structure is used in flight.

49. (Previously Presented) The system of claim 30, wherein receiving the input parameters comprises:

receiving a weight; and

receiving a location of the weight relating to the completed repair of the aircraft structure.

50. (Previously Presented) The system of claim 49, wherein the weight and the location of the weight relating to the one or more completed repairs performed on the structure exceed a predetermined category of approved repair parameters.